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Acute illness and job lock

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by

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Abstract

This paper assesses if the experience of an acute illness generates decreased job mobility among workers with employer-sponsored health insurance. An acute illness may increase the perceived value of health insurance and "lock" workers into jobs that provide health insurance as compensation. Using difference-in-difference tests, I evaluate the presence of job lock among workers impacted by acute health problems in Panel 19 of the Medical Expenditure Panel Survey. The results provide inconclusive evidence of job lock related to the experience of an acute illness. Further research on acute illness-related job lock can explore the potential long-term impact of job lock and different measures for acute illness to limit the effects of endogeneity in empirical models.

Introduction

In the United States, many workers receive health insurance as a part of their compensation. Health insurance through an employer is income-tax-free because the costs are paid with pre-tax dollars. Furthermore, coverage is usually less expensive as a group policy through an employer (Tunceli, Short, Moran, and Tunceli 2009). However, the use of health insurance as a fringe benefit is problematic because policies are specific to the employer and position held. The transfer of health coverage between employers is not guaranteed.

The connection between employment and access to health insurance reduces job mobility in what is known as "job lock." Workers remain in positions that ensure health insurance. Some workers will continue in positions poorly matched for their skill sets to retain health insurance creating employer-employee mismatch. These job-locked employees do not maximize their own skills and prevent qualified individuals from moving into more fitting positions.

Many studies have reviewed the relationship between job lock and health status. Persons with greater healthcare needs value insurance more. They are consequently less mobile in the workforce when their employer is their source of coverage. While the relationship between chronic illness and job lock is known, there is limited literature on the effect of acute illness. A chronic health issue generates high future healthcare costs in the long run locking a worker to employment supplying health insurance. Acute health problems are temporary and should not generate serious future financial burdens. However, the experience of short-term severe illness or injury may enhance risk aversion and increase the perceived value of coverage. In this study, I will explore the influence of serious acute illness on the mobility of persons reliant on employer-sponsored health insurance (ESHI). I expect to find the experience of a significant acute health issue will generate job lock for workers receiving employer-sponsored insurance.

My paper will expand current economic literature on the relationship between job lock and health status. The specific impact of acute ill health on job lock is largely unexplored, yet many people will experience acute ill health at some point in their careers. This work will contribute to a more thorough understanding of the causes of job lock. Recognizing if acute health problems do reduce mobility for US workers with employer-sponsored health coverage will provide direction for efforts to eliminate job lock.

Political and business leaders can design public policy and insurance practices more effective at allowing full labor mobility and proper employer-employee matching. This ability to reduce job lock could in turn enhance overall economic efficiency. Overqualified workers are compensated at lower levels than the value they provide (Duncan and Hoffman 1981). The elimination of mismatch caused by job lock will properly allocate resources and skills for greater productivity.

Furthermore, a greater understanding of the causes of job lock is particularly valuable due to the popularity of employer-sponsored health insurance in the United States. The 2016 Current Population Survey analyzed by Barnett and Berchick (2017) found 55.7% of individuals receive health coverage as a fringe benefit of their or their family member's employment. Previous Current Population Surveys demonstrate that rates of employer-sponsored health insurance have remained steady since 2013. Accordingly, a large portion of US workers are at risk of being "job locked" and contributing to inefficiency.

Literature Review

Since the 1990s, economists have applied behavioral economic principles to the study of labor markets. Becker's (1993) behavioral model suggested consumers can make choices in pursuit of characteristics like loyalty and altruism as much as for personal interest. The

application of Becker's perspective can explain inefficiencies in microeconomic labor supply and compensation decisions (Dohmen 2014). A major inefficiency in the labor market, labor mismatch, has been more recently understood through behavioral economic assumptions.

Mismatched workers are employed in positions that do not complement their skill set. Morgado et al. (2015) described the different types of mismatch as overeducation and undereducation. Overeducation mismatch occurs when workers possess a higher level of education than necessary for their positions (Ordine and Rose 2011). Duncan and Hoffman (1981) originally attributed employer-employee mismatch to faster growth in educational attainment than in skills requirements. Classical models assume a firm's production processes are flexible to adapt to increases in worker ability which contradicts the long-term prevalence of mismatch (Kleibrink 2016). Ordine and Rose (2011) applied a behavioral perspective to accurately explain observations of mismatch. They suggested employer-employee mismatch is a result of individual worker choice based on the variety of worker's compensation preferences.

Regardless of cause, the improper matching of workers to firms has significant consequences on economic efficiency due to inadequate compensation practices (see Bender and Heywood 2009, Leuven and Oosterbeek 2011, Kleibrink 2016). Duncan and Hoffman (1981) found disproportionate payoffs for education in mismatched workers. Years of required education produced statistically higher earnings for a position. However, surplus years of education increased earnings at lower rate than the required educational attainment. Bender and Heywood (2009) found similar results in a study of PhD-level scientists. Scientists whose education only partially matched their employment saw earning 6.9% lower than scientists in well matched positions. Completely unmatched scientists faced earnings 13.9% lower than well-

matched workers. Additionally, scientists had higher probabilities of turnover and lower rates of job satisfaction if their jobs did not relate to their education.

Kleibrink's (2016) analysis of the German labor market found mixed results on mismatch inefficiency. Too much or too little education had no effect on earnings, but the proper amount of education for a job statistically increased payoff. The exact scale of mismatch and the consequent economic inefficiency is unknown but Morgado et al. (2015) suggested that employer-employee mismatch is large. Across European countries, between 15 and 35% of workers hold positions that they are over or under qualified for.

While inefficient mismatch can increase the tendency of some workers to move between jobs (see Bender and Heywood 2009 and Pellizzari 2011), long-term mismatch can also be the outcome of limited mobility. "Job lock" is the condition of decreased mobility due to a reliance on employer-sponsored health insurance. In classical perfectly competitive markets, the value of health coverage is calculated for the worker at the margin of entry into the labor force. However, many workers value health insurance more than the worker at the margin creating friction in mobility. Because health insurance is not portable between jobs, workers themselves enforce mismatch by "locking" themselves in poorly matched jobs to retain access to health coverage (Chatterji, Brandon and Markowitz 2016).

Various studies have considered how employer-provided health insurance and other forms of compensation impact mobility. Mitchell (1982) and Allen, Clark and McDermed (1993) analyzed the non-portability of pensions as a cause of inflexibility in the labor market. Using probit regression analysis, Mitchell found that employer-provided pensions significantly lowered rates of job change for men and women. However, medical and life insurance as compensation

had an insignificant impact on labor turnover, although Mitchell attributed the insignificance to correlation between fringe benefits.

Research beginning in the 1990s specifically analyzed the presence of job lock related to ESHI using two primary techniques. One category of job lock literature measures changes in mobility among workers with ESHI due to public policy changes. If workers with ESHI are job-locked, new legislation that expands access to other sources of health insurance should increase their mobility rates more relative to individuals with other sources of insurance. The second category of literatures tests differences in mobility among workers who value coverage differently due to personal characteristics. Workers with ESHI who place a high value on health insurance should experience lower rates of job change than individuals without ESHI or who value health insurance less.

Empirical studies find mixed evidence of job lock using the two difference-in-difference techniques. Brigitte Madrian (1994) found initial proof of job lock by calculating differences in turnover rates for workers with comparatively high or low costs to losing health insurance. Assuming that the higher the cost of losing healthcare, the greater the impact of job lock, Madrian identified three unique measures of the cost of losing healthcare. She tested turnover rates between households with different access to alternative forms of health coverage, varied family sizes, and different immediate needs for care due to a pregnant family member. Madrian (1994) found significantly lower job mobility among workers relying on their employment for coverage. While controlling for household demographics such as income, education, and race, workers with employer coverage experienced a greater difference in mobility between workers with high and low costs of health insurance loss, consistent with the theory of job lock.

One criticism of Madrian's test for job lock using differences in health status and coverage availability is a failure to control for endogeneity (Hamersma and Kim 2009). Isolating job lock is difficult because factors affecting a worker's value for health insurance are generally related to other factors affecting job mobility. For example, workers with large families consume more healthcare which increases the value of the worker's health insurance. However, workers with large families may be more likely work in jobs with high salaries that offer flexible schedules making them less mobile.

Ideally, researchers can avoid endogeneity in measuring job lock if they can determine exogenous characteristics that increase the value of ESHI. They can show the extent of job lock through differences in mobility rates between groups with and without the exogenously determined characteristic. However, because exogenous characteristics are difficult to determine, studies can use difference-in-difference measurements to look for job lock within a sample. The difference-in-difference test measures if there is additional mobility loss generated from having both a high value for health coverage and ESHI. If job lock exists, there should be greater mobility loss due to a higher value for insurance for workers with ESHI than workers without ESHI. Finally, the endogeneity between ESHI and other job characteristics can be avoided by studying mobility among workers that did or did not receive offers of health coverage instead of workers that received or did not receive coverage. Workers who decline an offer of ESHI likely share other job characteristics with workers who accept offers of ESHI.

Several studies I discuss below apply Madrian's 1994 theory connecting worker or family health status and coverage to job lock and the authors use a variety of techniques to control for endogeneity. Buchmueller and Valletta (1996) extend Madrian's work by controlling for the impact of pension availability and job tenure on labor mobility. While Madrian tests for job lock

through the interaction between married men's coverage and their spouses' coverage, Buchmueller and Valleta suggest this effect creates a biased measurement of job lock for two reasons. Married men that can receive insurance from a spouse likely do not share many other characteristics with married men without insurance from a spouse. Furthermore, the likelihood of job change by a married worker is influenced by the job opportunities of a spouse.

Buchmueller and Valleta control for these sources of bias using two-stage probit regression for the interaction variable between worker and spousal coverage. They find women in dual earner families are significantly less mobile by approximately 34-38%. Men in dual earner families experience an insignificant reduction in mobility of 25-31%. When controlling for the probability of a spouse's job change, the loss of mobility among women increases but also becomes less significant at only a 12% level. Furthermore, the authors find insignificant rates of job lock among single men and men in single earner families but find ESHI significantly lowers the mobility of single women by as much as 35-40%.

Many studies find an individual's health status affects the likelihood of job lock. Stroupe, Kinney, and Kneisner (2001) specifically explore the role of chronic poor health in an individual or family member in creating labor force friction for employer-covered workers. Workers with chronically poor health or who are responsible for the care of a chronically ill family member face high present healthcare costs and expect to face high future costs. They are also less likely to find equivalent policies in a job switch and as such are at greater risk for job lock. Stroupe et al. estimate Cox proportional hazard models for leaving the labor market for individuals affected by chronic illness. Comparisons between those with ESHI and other sources of insurance show decreased mobility for individuals relying on employment for health coverage. Additionally, Stroupe, Kinney, and Kneisner's research reveals key similarities and differences in the

experience of job lock between men and women. Both chronically ill men and women with ESHI are approximately 40% less mobile than similar men or women with other sources of insurance. Men reliant on their employers for coverage experience a comparatively lower propensity to leave current employment due to the personal experience of a chronic illness. Job-locked women have relatively lower propensities to leave employment due to a family member's illness, rather than a personal health problem.

Tunceli, Short, Moran, and Tunceli (2009) consider the mobility of cancer survivors with employer-provided coverage. Due to pre-existing condition restrictions, cancer survivors are less likely to find comparable insurance policies after leaving a job. Furthermore, the authors note employer-sponsored coverage is generally less costly than individual insurance and is income-tax-free because ESHI is paid for with pre-tax dollars. They find statistically significant evidence of job lock for both male and female cancer survivors. Male cancer survivors with ESHI are 29.2 percentage points less likely to exit the workforce, while similar women have a lower probability of exiting by17.2 percentage points. Survivors also show lower rates of transition between jobs compared to non-cancer survivors (33.4 percentage points lower for men and 26.4 percentage points lower for women). However, Tunceli, Short, Moran, and Tunceli acknowledge potential bias in their difference-in-difference measurements due to the endogeneity of cancer survivorship.

Bradley, Neumark, and Motika (2012) find workers respond differently to specific types of health issues when relying on an employer for health insurance. They analyze the mobility of men who experienced various negative health shocks as the subgroup less likely to have alternative spousal coverage. However, poor health impacts employment status directly and indirectly through a reliance on ESHI. Furthermore, the presence of multiple chronic diseases in

a worker, also known as comorbidities, creates measurement error. As a control in their difference-in-difference measurements, Bradley, Neumark, and Motika differentiate between health problems with and without immediate comorbidities. They find significant job lock among men who experience a decline in health status without comorbidities while covered through their employers. Compared to healthy older men, men in poor health with ESHI are statistically more likely to remain at their jobs by nearly 30 percentage points.

In a similar study, Bradley, Neumark, and Barkowski (2013) find proof of job lock among married women with recent breast cancer diagnoses. Many workers facing serious health problems prefer to take time off for recovery. However, their immediate demand for healthcare increases meaning many must remain in the work force, often at full-time. Bradley, Neumark, and Barkowski survey female breast cancer patients at 2 months and 9 months after diagnosis They supplement the survey data with records of healthy individuals from the Current Population Survey to compare mobility rates between subgroups. The authors control for endogeneity by conditioning upon labor supply status prior to diagnosis. They find labor supply reductions among women with recent breast cancer diagnoses are approximately 8-11% smaller than labor supply reductions of women with other sources of insurance.

Using public policy changes as "natural experiments" to test for job lock also avoids endogeneity issues if the policy change has no direct effect on income or employment (Boyle and Lahey 2010). Evidence of job lock in policy studies is mixed.

Bansak and Raphael (2008) find evidence of reduced job lock in the introduction of the State Children's Health Insurance Program (SCHIP) which allowed families with incomes over Medicaid eligibility to purchase inexpensive insurance for their children. They compare rates of job change before and after the policy implementation for men with SCHIP-eligible children.

Fathers without access to insurance through a spouse experience job change 9 percentage points more often after the policy implementation compared to fathers with a spouse's insurance. Falsification testing with a higher income control group confirms the relative greater increase in mobility for married men without access to a spouse's health coverage. Boyle and Lahey (2010) use a similar technique to study job lock in veterans after the elimination of eligibility requirements for health coverage. With expanded coverage, veterans are more likely to cease working, more likely to switch to part-time work, and more likely to become self-employed if highly educated relative to non-veterans.

Hamersma and Kim (2009) examine reductions in job lock from the Medicaid expansion under the Personal Responsibility and Work Opportunities Reconciliation Act of 1996. They hypothesize that the Medicaid expansion changes the reservation threshold, the value at which a worker leaves his or her current job, of job-locked workers. However, the decrease in Medicaid eligibility requirements did not affect turnover rates for men and married women. Unmarried women experience only a 4 to 5% increase in job change per $100 change in the eligibility threshold. Hamersma and Kim attribute the small decrease in job lock to their sampling methods which focused on low income households.

Fairlie et al. (2016) explore the natural discontinuity of Medicare eligibility for adults at the age of 65 as a means of relieving job lock. As the availability of non-employer-funded insurance increases with access to government-provided Medicare, job mobility among workers over age 65 is expected to increase if job lock existed. However, the data, controlling for confounding demographic and work characteristics, reveals no significant difference in worker mobility between the pre-and post-Medicare eligibility period. Fairlie et al.'s findings suggest job lock may not be a major labor force issue for older workers.

Finally, Chatterji, Brandon, and Markowitz (2016) and Bailey and Chorniy (2016) find mixed evidence of job lock in analyzing the Patient Protection and Affordable Care Act (ACA). The ACA prevents child exclusions from coverage due to pre-existing conditions. Chatterji, Brandon, and Markowitz find significant reductions in job lock for married men with chronically ill children. Additionally, the ACA's dependent coverage mandate increases the availability of coverage for individuals aged 19-25 by allowing individuals below age 26 to remain on their parent's insurance. Bailey and Chorniy test for job lock among younger workers by measuring the change in the job mobility of adults ages 19 to 25 after the ACA passage compared to mobility changes in slightly younger and older adults. Bailey and Chorniy (2016) find no significant change in the job mobility rates of the 19 to 25-year-old cohort compared to other age groups suggesting job lock is not a major labor force issue for young adults.

Theory and Empirical Models

In this study, I extend previous research by Madrian (1994) and Stroupe, Kinney, and Kneisner (2001) that tests for job lock generated by a worker's health status[1]. I explore if the experience of an acute illness decreases rates of job change for workers with ESHI by increasing the perceived value of health insurance. To assess the effect of acute illness, I define the experience of an acute illness as a trip to the emergency room due to an accident or injury. A measure of acute illness as emergency room visits may be endogenous as the likelihood of going to the emergency room may be correlated with qualities of a worker's environment that directly influence job change. Therefore, difference-in-difference testing is the strongest means of testing for acute illness-related job lock with my data. The difference-in-difference test will provide an

[1] Previous research has not assessed the direct impact of ESHI on job mobility to avoid the possibility of omitted variable bias in most data sets. ESHI is likely correlated with many other characteristics that affect mobility in the labor force.

accurate measure of job lock assuming the effect of an acute illness on job mobility is the same for workers with ESHI and workers without ESHI.

Madrian (1994) developed difference-in-difference testing in linear probability models to isolate lower mobility in workers with employer-provided health insurance. The difference-in-difference test assumes that the difference in the likelihood of a job change for workers who highly value health insurance and workers who do not will be greater for workers with employer-sponsored health insurance than workers without insurance or covered through other means. To study if acute illness impacts worker mobility through ESHI, the difference-in-difference test for job lock where μ is the probability of a job change is seen below [2].

	Employer-Sponsored Health Insurance	
	No	Yes
Acute Illness	μ_a	μ_b
No Acute Illness	μ_c	μ_d

$$(\mu_d - \mu_b) - (\mu_c - \mu_a) > 0$$

I apply Madrian's method of probit regression modeling to test if the experience of an acute health problem impacts the likelihood of job change by generating job lock. I separately model the impact of a personal acute health problem and an acute health problem of a family member on worker mobility. I model personal illness and illness in the family as individual regression because Stroupe, Kinney, and Kneisner (2001) find the source of a chronic illness

[2] Madrian also provides a simple test of job lock: $\mu_d - \mu_b > 0$. Individuals covered by employer-sponsored health insurance without an acute health issue should be more mobile than employer-covered workers with an acute health problem. However, this test for job lock is typically considered weaker due to potential endogeneity, although it may be reasonable to assume certain measures of acute illness can be treated as exogenous variables.

affects the extent of job lock between men and women.

Regression Model 1 tests for acute injury-related job lock as follows.

(a) $Probability\ of\ Job\ Change = \beta_0 + \beta_1 * Employer\ Coverage_i + \beta_2 * Personal\ Acute\ Injury_i + \beta_3 * Employer\ Coverage_i * Personal\ Acute\ Injury_i + \beta_4 * X_i + \beta_5 * Z_i$

(b) $Probability\ of\ Job\ Change = \beta_0 + \beta_1 * Employer\ Coverage_i + \beta_2 * Family\ Member\ Acute\ Injury_i + \beta_3 * Employer\ Coverage_i * Family\ Member\ Acute\ Injury_i + \beta_4 * X_i + \beta_5 * Z_i$

The difference-in-difference test for job lock is found in the sign and significance of β_3 which measures the additional change in likelihood of job change generated by ESHI and an acute injury.

X_i is a vector of the following demographic characteristics that impact a worker's value for health insurance or likelihood of job change. I control for family size because larger families may value health insurance more as they consume more healthcare services (Madrian 1994). Job mobility may be impacted by the geographic labor market although the difference in job opportunities between each region of the United States is uncertain (Boyle and Lahey 2010). I also control for gender because previous studies have found estimates of job lock can differ between men and women (Buchmueller and Valletta 1996 and Stroupe, Kinney, and Kneisner 2001). Generally, workers with higher levels of education will be more mobile because they have valuable transferable skills. However, at very high levels of education, mobility might be limited due to an overspecialization of skills. Most previous studies on job lock control for education level although empirical significance varies (Buchmueller and Valletta 1996, Stroupe, Kinney, and Kneisner 2001, Madrian 1994, and Boyle and Lahey 2010). I control for race because Buchmueller and Valletta (1996) and Boyle and Lahey (2010) find members of racial minorities

to be less mobile. Finally, I expect a person's general health to impact likelihood of job change. Generally healthier workers will place less value on their health insurance which could increase their likelihood of changing employers. However, less healthy people may be more willing to cease working entirely because of their poor health. I also consider the effect of general health on mobility to isolate the impact of an acute illness on job lock because acute illnesses may be correlated with other health problems.

Z_i is a vector for the following job characteristics. I control for income as higher earnings in a current position increase the cost of a job change (Hamersma and Kim 2009 and Stroupe, Kinney, and Kneisner 2001). Receiving a pension as a non-transferable benefit in a current position lowers a worker's likelihood of job change (Hamersma and Kim 2009). Membership in a union lowers worker mobility by increasing the benefits available through certain employers (Buchmueller and Valletta 1996). Finally, I control for occupation type because workers in white-collar jobs tend to be more mobile than blue collar workers due to their transferable skills (Stroupe, Kinney, and Kneisner 2001).

Furthermore, I test a second regression model for acute injury-related job lock with an additional control for a worker's behavior in the labor market. I expect a worker's recent behavior in the labor force will affect future labor mobility decisions although the direction of this effect is uncertain. Recent job change may indicate an underlying propensity to change jobs (i.e. that someone is a mover) which may positively impact a worker's chance of job change. However, if a worker recently moved into a new position that better fits the worker's needs and skills, the cost of changing jobs has increased and the likelihood of job change should decrease. As in my first model, I will test the impact of a personal acute injury and an acute injury in the

family on job lock separately. Regression Model 2 tests for acute injury-related job lock as follows:

(c) $Probability\ of\ Job\ Change = \beta_0 + \beta_1 * Employer\ Coverage_i + \beta_2 * Personal\ Acute\ Health\ Problem_i + \beta_3 * Employer\ Coverage_i * Personal\ Acute\ Health\ Problem_i + \beta_4 * Recent\ Job\ Change_i + \beta_5 * X_i + \beta_6 * Z_i$

(d) $Probability\ of\ Job\ Change = \beta_0 + \beta_1 * Employer\ Coverage_i + \beta_2 * Family\ Member\ Acute\ Health\ Problem_i + \beta_3 * Employer\ Coverage_i * Family\ Member\ Acute\ Health\ Problem_i + \beta_4 * Recent\ Job\ Change_i + \beta_5 * X_i + \beta_6 * Z_i$

Data

I will study the impact of acute illness on job lock using data from Panel 19 of the Household Component of the Medical Expenditure Panel Survey (MEPS). The U.S. Department of Health and Human Services conducts this annual two-year panel survey to track change in the health statuses, health expenses, insurance coverage, and employment of individuals. The families and individuals surveyed are representative of the United States civilian non-institutionalized population and participated in the 2014 National Health Interview Survey. A new panel begins each year such that two panels of households are active during each year. Information for households in Panel 19 is collected through five rounds of interviews from January 1, 2014 to December 31, 2015. An individual respondent for each household participates in five rounds of interviews over a span of two years and provides information on all household members. Each household constitutes a unique Dwelling Unit of persons residing at a single address. Each Dwelling Unit consists of one or more families[3].

[3] A family is defined as a group of people connected by blood, marriage, adoption, or foster care or who self-identify as a family.

Descriptive statistics for the variables I include in my analysis are shown in Table 1. Data for the observations are measured by interview round. In Model 1, I test for job lock using observations of job change between any two interview rounds. In Model 2, to condition upon previous job change during the survey, I restrict my analysis to job change decisions made between Rounds 4 and 5. Job change takes on a value of 1 if an individual voluntarily left his or her current main job between two interviews. If an individual remained in the same current main job between rounds or involuntarily left his or her position, job change is recorded as 0. To experience a job change or no job change between two rounds, a worker must report a current main job during the first of the two rounds.

Acute illness is measured as a binary variable such that a value of 1 means the individual or family member experienced an acute health problem in the round directly before the round measuring a job change. For example, a worker either reports or does not report an acute health problem in Round 1 if the test for job change is between Round 1 and Round 2. In Model 2, acute illness takes a value of 1 if a worker or worker's family member experienced an acute injury anytime in Rounds 1 through 4. As stated previously, I define an acute illness as an emergency room visit for the treatment of an injury or an accident constitutes an acute health problem. Because an acute illness refers to any health problem that occurs suddenly for a discrete time, injuries or accidents requiring emergency care meet these criteria. However, some acute illnesses are not captured in a measure of emergency room visits, for example, if individuals chose to forgo medical care or seek care outside of an emergency room for serious incidents. I address the potential errors from this measurement of acute illness in the discussion section.

Finally, ESHI takes on a value of 1 if the worker received health insurance from his or her employer in the round preceding the potential job change.

As previously mentioned, I will include additional variables for job characteristics and personal demographics to control for natural variation in mobility rates. All control variables apart from education level and recent job change are measured at the interview round preceding a job change. Recent job change is included as a binary variable such that 1 means the worker changed jobs between any two previous survey rounds. Workers for which recent job change is measured have reported their job change decisions throughout Rounds 1, 2, and 3 meaning they are present in the survey across all rounds. Family size is measured as the total number of people identifying as a member of the worker's family unit. Age measures the age of the worker in years. Race is measured in the following series of binary variables: Hispanic, White, Black, Asian, and Multiple Races. I omit White as the reference category to calculate the specific effects of racial minority status on labor mobility. Geographic region of the United States is measured as a set of dummy variables, Northeast, Midwest, West, and South, in the round before a potential job change. I omit Northeast as the reference category. Male is a dummy variable for gender such that a value of 1 indicates a male worker. The general health of the individual is also represented in a set of dummy variables. Survey respondents measured each household member's perceived health as excellent, very good, good, fair, or poor. General health is a self-reported measure and responses are heavily skewed towards better health which could suggest a trend toward inflating one's health status. However, individuals with significant health problems may be less willing to participate in two-year intensive survey if randomly selected precisely because of their poor health. As such, better perceived health among participants may be an accurate representation of general wellbeing. I will omit excellent general health as the reference category. Finally, education is measured as a person's highest level of education attained at their entrance into the survey. The possible categories are less than a high school degree, a high school

degree or equivalent, a bachelor's degree, and a graduate degree and I omit bachelor's degree as the reference category.

An individual's wage level in the round preceding a possible job change is included in dollars as an hourly wage.[4] Union membership is accounted for as a binary variable such that 1 means the individual is a member of a union. White-Collar is a dummy variable with a value of 1 signaling the individual holds a white-collar job[5]. Finally, Pension is dummy variable such that a value of 1 means the individual receives a pension as a fringe benefit of employment in the round prior to a job change.

Descriptive statistics for the data are found in Table 1. All tables are found in the Appendix. Almost half of respondents receive health insurance through their employers which is nearly representative of ESHI in the U.S. population (Barnett and Berchick 2017). Measures of personal acute injury and family member acute injury among survey respondents are low at approximately 3% and 6% of participants respectively.

Results

I first run simple difference-in-means T-tests on the samples for Model 1 and Model 2 individually to test the impact of acute injury and ESHI on job mobility without controlling for demographic and job characteristics. Sample 1 considers individuals' decisions to change jobs between any two consecutive rounds in the survey and is used in Model 1. Sample 2 considers job change decisions occurring between Round 4 and Round 5 and these observations are tested in Model 2. Table 2 presents the T-test results.

[4] The maximum hourly wage is $78 in 2014 and $80 in 2015. The MEPS does not report the specific value of an hourly wage over $78 or $80 for confidentiality purposes.

[5] White-collar jobs are defined as those in management, business, financial operations, professional or related occupations, service, sales, and office-related occupations. Positions in farming, fishing, forestry, construction, extraction, maintenance, production, transportation, military, and unclassifiable occupations are non-white-collar jobs.

As expected, individuals without ESHI are significantly more mobile than individuals with ESHI for both samples. Individuals who have experienced a personal acute injury are more mobile than individuals who have not experienced acute injury without controlling for other factors. In both samples, there is no significant difference in mobility between persons who experience an acute injury in the family and individuals with no acute injury in the family. The interaction variable for ESHI and family member acute injury shows significantly less job change among individuals who experience an acute injury in the family and hold ESHI. This difference is significant in both Sample 1 and Sample 2, but we should consider that the interaction variable T-test which does not control for other factors could be picking up the strong impact of ESHI on job mobility. Finally, the interaction variable for ESHI and individual acute injury shows no significant difference in mobility for individuals holding ESHI who experience an acute injury relative to other groups in both samples.

Table 3 presents the results of the probit regression analysis for Model 1 which estimates the impact of acute injury and ESHI on job mobility between two consecutive rounds. I first consider the impact of the control variables on job mobility without the test for job lock to confirm the expected effects of the control variables (Table 3 Column A). As anticipated, family size has a significant negative impact on the likelihood of job change. Older, higher-income, male workers with pensions are significantly less likely to change jobs. Living in the Midwest or South increases one's likelihood of changing jobs compared to living in the Northeast. Asian and Hispanic individuals are significantly less likely to change jobs than White individuals. There is no significant difference in mobility between workers in excellent health and very good health. Being in good health decreases a worker's likelihood of job change compared to having excellent health. Workers in fair or poor health are significantly more likely to change jobs than those in

excellent health. Union membership significantly decreases likelihood of job change. Persons with graduate level education were significantly more likely to change jobs than persons with bachelor's degrees. However, no significant difference in mobility is found between individuals with a high school degree or less and bachelor's degree holders.

I next test the full specifications of Model 1 for the effects of personal and family member acute injury on job lock. The regression results can be found in Table 3 Columns B and C for personal acute injury and family member acute injury respectively. Family size, worker age, income, union membership, and pensions significantly decrease the likelihood of job change as expected. There are no major differences in the effects of control variables in the full specifications of Model 1 apart from gender and type of occupation. Neither gender nor holding a white-collar job significantly affects likelihood of job change when including variables for ESHI and acute injury. ESHI significantly decreases the likelihood of job change and personal acute injury significantly increases the chance of job change at the 1% level. An acute injury in the family does not significantly affect job mobility. There is no evidence of job lock in the survey round directly following the experience of a personal acute injury or family member acute injury. The interaction between ESHI and personal acute injury has a positive insignificant coefficient as does the interaction between ESHI and family acute injury.

Table 4 shows the probit coefficients for Model 2 estimating acute injury-related job lock with an additional control for job changes between previous survey rounds. I once again first consider the effects of the control variables on job mobility without the test for job lock to confirm the expected effects (Table 4 Column A). Recent job change in the previous survey rounds has a significant positive impact on likelihood of job change between Rounds 4 and 5. Higher income workers, men, older workers, and workers with pensions or union memberships

are significantly less likely to change jobs as expected. Race and self-reported health status do not significantly impact job mobility. Of the controls for region of the U.S., only South has a significant coefficient. Graduate degree holders are more likely to change jobs than bachelor's degree holders, but there is no significant difference in mobility between bachelor's degree holders and those with lower levels of education.

Finally, I test for acute injury-related job lock using the full specification of Model 2 and regression results are shown in Table 4 Columns B and C. The impact of ESHI remains negative and highly significant. Acute injuries in the family or to the individual have no significant impact on the likelihood of job change when controlling for other personal and job-related characteristics. Model 2 shows evidence of job lock generated by a family member's acute injury but shows no evidence of personal acute injury-related job lock. The coefficient for the interaction between ESHI and individual acute injury is positive and insignificant. The interaction between ESHI and family acute injury has a negative coefficient that is significant at the 10% level. The effects of most control variables do not change when the tests for job lock are included. Older individuals, men, pensioned or union workers, and individuals with larger families remain significantly less likely to change jobs holding all else constant. However, all dummy variables for region become insignificant. Furthermore, hourly wage becomes insignificant although the coefficients retain the expected negative sign in both models of acute injury.

Discussion

The tests for acute injury-related job lock provide very weak evidence for reduced labor mobility from ESHI. Personal acute injury does not reduce mobility more for workers with ESHI relative to other groups when considering job mobility between two consecutive survey rounds

or with controls for previous job change in the survey. Acute injury in the family does not reduce mobility more for employees with ESHI between any two consecutive rounds. A family member's acute injury enhances job lock for workers between Rounds 4 and 5 when controlling for previous job change in Rounds 1 through 3 among other personal and job characteristics. However, this evidence for job lock is not strong. The fact that hourly wage has an insignificant impact on the likelihood of job mobility between Rounds 4 and 5 suggests there may be omitted variable bias or measurement error in the data. Furthermore, as part of a sensitivity analysis for job lock, I control for time effects in Model 1 by regressing observations of job change separately between Round 1 and 2, Rounds 2 and 3, etc. The Model 2 regressions use a similar set of observations as the sensitivity analysis regressions for acute injury-related job lock between Rounds 4 and 5. The sensitivity analysis regression does not control for job change in previous rounds and acute injury is measured as visits to an emergency room occurring during Round 4. Like in Model 2, the test for family acute injury-related job lock in the sensitivity analysis regression shows significant proof of job lock and the coefficient for hourly wage becomes insignificant. No other regressions in the sensitivity analysis provide evidence of job lock. Because evidence of acute injury-related job lock is found solely between Rounds 4 and 5, there may also be an uncontrolled time-related factor generating family acute injury-related job lock. Rounds 4 and 5 of Panel 19 take place during the end of 2015 and it is possible an external event or trend occurred during this time period generating acute injury-related job lock.

More generally, the results of the regression models in this study may be impacted by attenuation bias and multicollinearity. Using emergency room visits as a measure of acute injury does not capture all acute illness or injury experienced by the survey respondents. For example, some respondents that experienced acute illnesses could have sought care from their primary

care physicians or visited a local clinic rather than an emergency room. These unobserved instances of acute illnesses could bias the interaction variable coefficients toward zero. Furthermore, it is possible some individuals and family members who experience acute illness or injury choose not to go to the emergency room because they do not have health insurance. As such, the independent variables for acute injury measured as emergency room visits and ESHI could be correlated and result in larger standard errors for significance-testing the coefficients. However, this analysis also uses a large sample size which should lower coefficient standard errors for significance-testing. Finally, the models used in this study measure job lock only in the immediate months following an acute injury to best fit the survey structure used by the MEPS. The MEPS only tracks respondents for at most two years over five survey rounds yet the full effect of job lock generate by acute illness may only be observed over a longer time period than a few months after an acute illness.

Conclusion

The results of this study find inconclusive evidence of job lock generated by the experience of an acute illness. The data suggests that a family member's acute injury may generate job lock, but there may be an uncontrolled time effect toward the end of 2015 affecting this estimate of job lock. Furthermore, the findings may be impacted by measurement error due to the definition of acute illness as emergency room visits as well as collinearity between emergency room visits and health insurance. Additional research on acute injury-related job lock can expand the time period for observing acute illness and job change to test if job lock is generated over longer periods. Future studies might also test specific types of acute illness, such as flu incidence, to control for attenuation bias in measures of job lock.

Appendix

Table 1: Descriptive Statistics

Variable	*N*	*Mean*	*Std Dev*	*Minimum*	*Maximum*
Job Change	24941	0.078	0.268	0	1
Recent Job Change	6277	0.139	0.346	0	1
Personal Acute Injury	24941	0.032	0.177	0	1
Family Member Acute Injury	24941	0.063	0.243	0	1
Family Size (# of Members)	24941	3.174	1.657	1	13
Region of U.S.					
Northeast	24941	0.142	0.349	0	1
Midwest	24941	0.189	0.391	0	1
South	24941	0.372	0.483	0	1
West	24941	0.298	0.457	0	1
Age	24941	40.506	13.598	16	84
Male	24941	0.510	0.500	0	1
Race					
Hispanic	24941	0.306	0.461	0	1
White	24941	0.389	0.487	0	1
Black	24941	0.194	0.396	0	1
Asian	24941	0.082	0.275	0	1
Multiple Races	24941	0.029	0.167	0	1
General Health Status					
Excellent	24941	0.277	0.448	0	1
Very Good	24941	0.353	0.478	0	1
Good	24941	0.283	0.450	0	1
Fair	24941	0.078	0.268	0	1
Poor	24941	0.009	0.095	0	1
Hourly Wage ($)	24941	19.587	13.870	0.28	80
Union Member	24941	0.114	0.318	0	1
White Collar	24941	0.746	0.435	0	1
Pension	24941	0.474	0.499	0	1
ESHI	24941	0.499	0.500	0	1
Education					
Less than High School	24941	0.159	0.366	0	1
High School	24941	0.573	0.495	0	1
Bachelor's Degree	24941	0.171	0.376	0	1
Graduate Degree	24941	0.097	0.296	0	1

Table 2: T-test Results

Variable	*Sample 1*	*Sample 2*
ESHI	20.11 (<.0001)	10.47 (<.0001)
Personal Acute Injury	-4.33 (<.0001)	-3.16 (0.0016)
Family Member Acute Injury	-1.01 (0.3136)	-0.32 (0.7474)
ESHI*Personal Acute Injury	0.02 (0.9867)	1.03 (0.3038)
ESHI*Family Member Acute Injury	4.06 (<.0001)	5.26 (<.0001)

T-Statistic (p-value)

Table 3: Model 1 Results

Variable	*A: Controls Only*	*B: Personal Acute Injury*	*C: Family Member Acute Injury*
Intercept	-0.537***	-0.515***	-0.501***
	(0.078)	(0.079)	(0.079)
ESHI		-0.321***	-0.319***
		(0.031)	(0.031)
Personal Acute Injury		0.199***	
		(0.072)	
Family Member Acute Injury			0.034
			(0.059)
ESHI*Personal Acute Injury		0.101	
		(0.127)	
ESHI*Family Acute Injury			0.021
			(0.104)
Family Size	-0.013*	-0.018**	-0.020***
	(0.007)	(0.007)	(0.007)
Midwest	0.133 ***	0.144***	0.144***
	(0.043)	(0.043)	(0.043)
South	0.082**	0.105***	0.103***
	(0.039)	(0.039)	(0.039)
West	0.065	0.086**	0.085**
	(0.041)	(0.041)	(0.041)
Hispanic	-0.169 ***	-0.167***	-0.168***
	(0.033)	(0.033)	(0.033)
Black	-0.044	-0.043	-0.041
	(0.034)	(0.034)	(0.034)
Asian	-0.142***	-0.128**	-0.130**
	(0.051)	(0.051)	(0.051)
Multiple Races	0.051*	0.069	0.070
	(0.067)	(0.067)	(0.067)
Age	-0.015***	-0.015***	-0.015***
	(0.0009)	(0.0009)	(0.0009)
Male	-0.044*	-0.032	-0.034
	(0.026)	(0.026)	(0.026)
Very Good	-0.008	-0.005	-0.002
	(0.030)	(0.033)	(0.030)
Good	-0.065**	-0.069**	-0.064*
	(0.032)	(0.033)	(0.033)
Fair	0.083*	0.066	0.082*
	(0.048)	(0.049)	(0.048)
Poor	0.306***	0.301***	0.328***
	(0.111)	(0.112)	(0.112)
Hourly Wage	-0.006***	-0.004***	-0.004***
	(0.001)	(0.001)	(0.001)
Union Member	-0.164***	-0.121**	-0.118**
	(0.047)	(0.048)	(0.048)
White Collar	0.055*	0.043	0.044
	(0.031)	(0.031)	(0.031)
Pension	-0.295***	-0.151***	-0.153***
	(0.029)	(0.032)	(0.032)
Less Than High School	-0.033	-0.065	-0.064
	(0.049)	(0.049)	(0.049)
High School	-0.022	-0.034	-0.033
	(0.037)	(0.038)	(0.038)
Graduate Degree	0.186***	0.182***	0.181***
	(0.051)	(0.052)	(0.052)

** p< 0.1; ** p< 0.05; *** p<0.01*

Table 4: Model 2 Results

Variable	*A: Controls Only*	*B: Personal Acute Injury*	*C: Family Member Acute Injury*
Intercept	-0.635***	-0.597***	-0.587***
	(0.168)	(0.170)	(0.169)
ESHI		-0.356***	-0.322***
		(0.069)	(0.066)
Personal Acute Injury		0.131	
		(0.088)	
Family Member Acute Injury			0.062
			(0.113)
ESHI*Personal Acute Injury		0.118	
		(0.157)	
ESHI*Family Acute Injury			-0.381*
			(0.269)
Recent Job Change	0.323***	0.285***	0.287***
	(0.063)	(0.064)	(0.064)
Family Size	-0.037**	-0.043***	-0.044***
	(0.016)	(0.016)	(0.016)
Midwest	0.031	0.047	0.048
	(0.089)	(0.089)	(0.089)
South	0.082**	-0.007	-0.013
	(0.039)	(0.080)	(0.080)
West	0.-0.094	-0.069	-0.070
	(0.085)	(0.085)	(0.085)
Hispanic	-0.084	-0.080	-0.080
	(0.069)	(0.069)	(0.069)
Black	-0.024	-0.035	-0.022
	(0.073)	(0.073)	(0.073)
Asian	-0.131	-0.120	-0.130
	(0.111)	(0.112)	(0.112)
Multiple Races	0.148	0.151	0.158
	(0.135)	(0.137)	(0.136)
Age	-0.011***	-0.010***	-0.010***
	(0.002)	(0.002)	(0.002)
Male	-0.154***	-0.141**	-0.149***
	(0.055)	(0.055)	(0.055)
Very Good	-0.012	-0.006	-0.0005
	(0.064)	(0.065)	(0.065)
Good	-0.042	-0.056	-0.04
	(0.068)	(0.069)	(0.069)
Fair	-0.003	-0.038	-0.007
	(0.108)	(0.110)	(0.109)
Poor	0.250	0.225	0.259
	(0.290)	(0.297)	(0.295)
Hourly Wage	-0.005**	-0.003	-0.003
	(0.002)	(0.002)	(0.002)
Union Member	-0.285**	-0.229**	-0.215*
	(0.110)	(0.112)	(0.112)
White Collar	0.005	-0.007	-0.005
	(0.065)	(0.066)	(0.066)
Pension	-0.313***	-0.166**	-0.175**
	(0.062)	(0.068)	(0.068)
Less Than High School	0.060	0.012	0.017
	(0.103)	(0.104)	(0.104)
High School	-0.010	-0.028	-0.024
	(0.083)	(0.084)	(0.083)
Graduate Degree	0.245**	0.227**	0.220*
	(0.113)	(0.114)	(0.114)

** p< 0.1; ** p< 0.05; *** p<0.01*

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